

Additional Components of the Still-Face Effect: Commentary on Adamson and Frick
Jeffrey F. Cohn
University of Pittsburgh

Abstract

Adamson and Frick provide an informative and often fascinating history of the still-face paradigm and its applications in infancy research. With benefit of their review, one can identify several potentially important components of the still-face paradigm that have been neglected in past research. These are the influence of the still-face on parent and infant behavior during the reunion episode and expanded measurement of the still-face effect to include theoretically important components of facial expression and the temporal organization of parent and infant behavior and physiology. In particular, by expanding what is meant by the still-face effect to encompass aspects of the reunion episode, we may discover robust probes into the parent-infant relationship and individual differences in infant attachment and emotion regulation extending across infancy and childhood.

**Additional Components of the
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Adamson and Frick (In press) provide an informative and often fascinating history of the still-face paradigm and its applications in infancy research. As they describe, the still-face was developed and assumed prominence as part of a radical shift in our view of the human infant, from passive and undifferentiated to active, competent, and pre-adapted for social interaction. This initial focus canalized subsequent research in ways both productive and limiting. A large corpus has well documented the infant's sensitivity and resources in responding to the still face, underlying mechanisms (e.g., role of maternal touch or the timing of the still face with respect to infant attention and affect [Muir & Hains, 1993; Cohn & Elmore, 1988]), and differences in infant competence related to factors such as maternal depression (Field, 1984). Adamson and Frick serve the field well by placing this literature in its historical context and providing the necessary groundwork for quantitative meta-analyses to inform theory about underlying

mechanisms and sources of individual differences in the still-face effect.

The authors thoroughly outline ways in which the still-face paradigm has been and continues to be used. With benefit of their review, one can identify several potentially important components of the still-face paradigm that have been neglected in previous research. One of the most important may be the relation between infant response to the still-face and parent and infant behavior during the ensuing reunion interaction. Cohn and Tronick (1983) in an early study using a variant of the still face (simulated depression) found that infants remained more negative and less positive well into the following reunion condition. Because the still-face effect came to be narrowly defined as infant behavior occurring during the still-face condition alone, such effects remained unexplored with few exceptions (Kogan & Carter, 1996). Reunion behavior was seen as something separate from and less interesting or important than that occurring proximal to the still face condition. This failure to define reunion behavior as part of the still-face effect is in marked contrast to that of closely related paradigms, in particular the strange

situation (Ainsworth, Blehar, Waters, & Wall, 1978), which was developed at about the same time as the still-face paradigm.

The still-face and strange situation paradigms both involve age-appropriate separation from the parent followed by (one or more) reunion episodes. Separation is emotional in the still-face and physical in the strange situation, differences necessitated by the representational capabilities of younger and older infants, respectively. In the still-face paradigm, infant behavior during the (emotional) separation has been of primary interest for reasons cogently presented by Adamson and Frick. In the strange situation, by contrast, relatively little attention has been given to infant behavior during the (physical) separation. One reason may be that attachment theory and research were less concerned with infant competence in response to separation; Bowlby (1969) had already made a compelling case for attachment behavior in both humans and non-humans. Ainsworth and her colleagues were far more interested in individual differences in attachment behavior, for which the reunion proved more informative. How infants responded during reunion was predicted by individual differences in parent-infant relationships earlier in the first year and predictive of social and emotional outcomes in the second year and beyond (DeWolf and van IJzendoorn, 1997). While separation behavior was not unimportant, attachment behavior, at least for purposes of classification, came to be defined in large part as infant behavior during the reunion episodes. Still-face researchers, by contrast, even when concerned with individual differences, continued to emphasize separation over reunion.

A number of studies have found predictive correlations between infant

behavior in the still-face condition and subsequent attachment classification (Braungart-Rieker, Garwood, Powers, & Wang, 2001; Cohn, Campbell, & Ross, 1991; Kiser, Bates, Maslin, & Bayles, 1986; Tronick, Ricks, & Cohn, 1982). Infants who positively elicit the mother during the still face are more likely to be classified as securely attached at 12 or 13 months. It is an open question whether infant and parent behavior during the reunion episode of the still-face paradigm would provide even stronger evidence of individual differences as well as more consistent relationships to emotion regulation in the second year and beyond than has been found to date (Moore, Cohn, & Campbell, 2001; Kiser et al., 1986). In that attachment classification is primarily defined by infant behavior during reunion while still-face effect is defined solely by infant behavior during (emotional) separation, it is likely that assessment of continuity would be enhanced by including observations of infant emotion regulation from conceptually similar conditions (i.e., reunion in still-face and in strange situation). Emotion regulation includes such behaviors as redirecting attention away from source of distress and toward object engagement, which occur in both paradigms. Moreover, to the extent that maternal sensitivity is critical to both infant emotion regulation in dyadic context (Brazelton, Koslowski, & Main, 1974) and the development of attachment security (DeWolf and van IJzendoorn, 1997), the reunion episode of the still-face paradigm affords unique opportunity to assess how parent and infant negotiate the disruption in their relationship occasioned by the still-face condition. The reunion condition allows for assessment of parent and infant affect and infant emotion regulation as well as dyadic measures of synchrony and bidirectional influence (Cohn & Tronick, 1988). Future research using the still-face paradigm could benefit by

expanding the meaning of still-face effect to encompass that which occurs during the reunion condition.

Beyond expanding what is meant by the still-face condition to include the reunion, we would do well to bring additional descriptive and analytic power to bear in measurement of infant and parent behavior and more attention to the dynamic relation between behavior and physiology. With few exceptions, measurement of the still-face effect has defined infant behavior relatively coarsely and without respect to temporal organization. Smiling, for instance, typically is defined only with respect to appearance changes or actions in the mouth region. In research with both infants and adults, investigators have found important differences between smiles occurring with and without contraction of the *orbicularis oculi* (i.e., what are referred to as Duchenne or felt smiles). Theory and some data suggest that Duchenne smiles are associated with differential patterns of frontal brain activation and likelihood of crying (Fox & Davidson, 1988). Smiles in older children and adults also may occur with facial actions suggestive of negative emotion (Ekman, Friesen, & O'Sullivan, 1988) although similar work in infants has yet to be reported. The descriptive tools for pursuing such questions exist (Ekman & Friesen, 1978; Oster, undated) but have yet to be used in still-face studies. Improved quantitative measurement using automatic extraction of facial features and their change in intensity and appearance over time (Cohn, Zlochower, Lien, & Kanade, 1999; Cohn, Zlochower, Lien, Wua, & Kanade, 2000) can make possible advances in our understanding of the still-face effect. Schmidt and Cohn (2002), for instance, using automatic quantitative measurement of facial expression found theoretically important differences in the timing of facial

action in adults in relation to communicative intention. A next step is to use these tools to test hypotheses about the timing of facial behavior and communicative intent in the still-face paradigm.

Our understanding of mother-infant interaction has been informed by use of time-series methods. Cohn and Tronick (1988), for example, showed that infant- and parent behavior during face-to-face interaction represented both self- and mutual regulation through a process of bidirectional influence. Similar analytic methods have yet to be applied to the still-face or reunion conditions. Investigators typically count the frequency of target behaviors (e.g., smiling) or whether or not they have occurred. We know little about the timing of infant behavior during the still-face condition. From Cohn and Tronick's study of simulated depression, we know that infants briefly elicit their mother to resume normal behavior and also cycle between negative affect states and looking away. Are these patterns stationary, that is are they stable throughout the still face condition? Are there meaningful individual differences in the patterning of infant response related to attachment or emotion regulation in other contexts? These would seem to be worthwhile topics for new research.

The still-face paradigm has been central to research efforts in early infancy for over 20 years. By expanding what we mean by still-face effect to include reunion behavior, employing more powerful methods of measuring parent and infant behavior, and modeling the dynamics of parent and infant behavior over time and in relation to underlying physiology, the still-face paradigm will continue to generate theoretically informative findings well into the future.

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Correspondence concerning this article
should be addressed to the author at the
Department of Psychology, 4327 Sennott
Square, 210 South Bouquet Street,
Pittsburgh, PA 15260. Address electronic
mail to jeffcjohn@pitt.edu.